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PCT/KR2004/000560

## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



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Applicant's or agent's file reference PCT204-0037	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. <b>PCT/KR2004/000560</b>	International filing date(day/month/year) <b>16 MARCH 2004 (16.03.2004)</b>	Priority date (day/month/year) 17 MARCH 2003 (17.03.2003)
International Patent Classification (IPC) or national classification and IPC <b>IPC7 H01L 21/66</b>		
Applicant <b>PHICOM CORPORATION et al</b>		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 3 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
  - ☒ (sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:
    - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_ containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:
  - ☒ Box No. I Basis of the report
  - ☐ Box No. II Priority
  - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☐ Box No. IV Lack of unity of invention
  - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Box No. VI Certain documents cited
  - ☐ Box No. VII Certain defects in the international application
  - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand <b>05 OCTOBER 2004 (05.10.2004)</b>	Date of completion of this report 13 JUNE 2005 (13.06.2005)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer MAENG, Sung Jae Telephone No. 82-42-481-5727 

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/000560

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☒ This report is based on translations from the original language into the following language English which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☒ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☐ the description:  
pages \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_  
pages\* 11-13 \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:  
pages \_\_\_\_\_  
pages\* \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, Nos. 2 and 6
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/000560

## Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1, 3-5, 7-10	YES
	Claims	none	NO
Inventive step (IS)	Claims	1, 3-5, 7-10	YES
	Claims	none	NO
Industrial applicability (IA)	Claims	1, 3-5, 7-10	YES
	Claims	none	NO

### 2. Citations and explanations (Rule 70.7)

The invention relates to a probe positioning and bonding device and a method to fix probes to predetermined positions on a probe card substrate.

Following documents have been cited in the International Search Report:

- D1: KR 89-4245 Y1 (In-Chul Yoon) 26 June 1989
- D2: JP 60-247487 A (NIPPON DENKI KK) 07 December 1985
- D3: US 5811751 A (Tony P. Leong, et al. ) 22 September 1998

1. D1 discloses an automatic bonding apparatus comprising a table base, a table, a wafer holder, bonding arms, a motor, and a controller.

2. D2 discloses a wire bonding apparatus with a laser source.

3. D3 disclose a probe station comprising a base machine, a chuck, a probe platen, a microscope, and a single laser.

However, the documents D1-D3 does not suggest the special feature of a controllable fixed part for a probe and a bonding method. Claims 1, 3-5, and 7-10 are considered to have inventive steps. The invention claimed in claims 1-10 is considered to be novel and industrial applicable.

## Claims:

1. (amended) A probe positioning and bonding device comprising:  
a stage unit disposed on a working table, wherein the stage unit is comprised of an  
x-axis moving stage, a y-axis moving stage, a z-axis moving stage, and a rotating stage,  
5 the rotating stage being rotated about the z-axis, and wherein the x-axis moving stage, the  
y-axis moving stage, the z-axis moving stage, and the rotating stage are vertically  
disposed one on another from bottom to top;  
a microscope disposed above the stage unit while being supported by means of a  
first supporting member disposed on the working table;  
10 a probe fixing unit disposed above the stage unit and below the microscope while  
being supported by means of a second supporting member disposed on the working  
table; and  
a light source unit supported by means of a third supporting member disposed on  
the working table, the light source unit being disposed toward the upper part of the stage  
15 unit, wherein the light source unit is a laser-generating apparatus.

## 2. (cancelled)

3. (amended) the device as set forth in claim 1, wherein the probe fixing unit  
comprises:

- a pincette for holding the probe;  
20 a reciprocating mover having a piston structure driven by means of air or a solenoid  
for operating the pincette; and  
a bracket for supporting the pincette and the reciprocating mover.

4. The device as set forth in claim 3, wherein the probe fixing unit further  
comprises a z-axis moving stage connected to the bracket such that the stage is slidably  
25 moved on the second supporting member.

5. The device as set forth in claim 3,  
wherein the probe fixing unit further comprises: an adjusting member for  
adjusting the position of the pincette in the x direction; an open angle controller for

restricting an open angle of the pincette to a prescribed limit; and a z-axis moving stage connected to the bracket such that the stage is slidably moved on the second supporting member, and

5 wherein the pincette has grooves formed at the insides of the lower ends thereof, respectively.

6. (cancelled)

7. A probe bonding method comprising:

10 a step 1 for disposing a substrate having a bonding agent applied to a prescribed area thereof on a stage, and operating the stage to place a prescribed point of the substrate on the focal point of the microscope having the fixed position;

a step 2 for fixedly placing the probe on the focal point of the microscope to contact the probe to the prescribed point on the substrate; and

15 a step 3 for emitting a laser beam to the connected parts of the prescribed point and the probe to bond the probe on the substrate,

wherein a plurality of probes are bonded on the substrate by successively repeating the steps 1 to 3 so that the probes having a prescribed arrangement are formed on the substrate.

8. The method as set forth in claim 7,

20 further comprising, between the step 1 and the step 2, a step for unloading the stage from the focal point of the microscope to provide a space for a probe feeding operation,

wherein the unloaded stage is loaded to the focal point of the microscope at the step 2 so that the prescribed point on the substrate is connected to one end of the probe.

25 9. The method as set forth in claim 8,

further comprising, before the step 2, a step for fixing the probe to a prescribed part of the probe fixing unit disposed on the focal point of the microscope so that the probe is placed on the focal point of the microscope, and

further comprising, after the step 3, a step for releasing the bonded probe from the prescribed part of the probe fixing unit.

10. The method as set forth in claim 7,

5 wherein the probe is fixed to the prescribed part of the probe fixing unit placed on the focal point of the microscope to put the probe on the focal point of the microscope at the step 2 so that the probe is connected to the prescribed point on the substrate,

the method further comprising, after the step 3, a step for releasing the bonded probe from the probe fixing unit.